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January 1991

The HUGgers Newsletter

Volume 10, Number 1

Officers Corner:

By Dan H. Eicher, President

Well it is January, which means the weather can only get better and the days will start getting longer! It also means that election happens at this meeting. The secretary and I are returning to school so we will not have as much time to donate to the group as before. I think this year has been the most active that our group has seen in at least 5 years. We have gained many new members, been represented at 3 major all TI shows, added gobs of new software to our library, expanded our BBS system to 2400 baud and a harddrive and the quality of newsletter has achieved the same level of quality that it had back in 1983-84, in my opinion, the heyday for OUR users group and the 99/4a world.

I recently "GOT AROUND 100" installing and studying the features of ROS 8.14 for the Horizon. This version, called SERIES 8 by its creator Gary Bowser, is a major upgrade that must be rated in importance with John Johnson's Menu program. I would like to give a little history of the Horizon ram disk and its software.

The original Horizon board was designed around 1984 by David Romer, John Clulow and Ron Gries. These are the same group of fellows who brought you the super cart, which opened up a whole new world to programmers. They later sold the rights to the Horizon design, name, manual and responsibilities to Bud Mills. They did not sell to Bud the rights to the original 8k ros since that was placed in the public domain. Any later version of the ROS are not public domain. Then John Johnson and Mike Ballmann got together and cleaned up the original horizon ROS and added support for boards with the then new 32k memory chips, later John Johnson wrote his fantastic utility/menu program that greatly increased the versatility of the HRD.

During the time that the original Horizon (which used 8k ram chips) was being updated to use the newer 32k ram chips, Mike Ballmann made a limit run of the 32k ram boards under the name Midwest Computers, which sparked a "war" between Bud and Mike, which has only recently been resolved.

For about a year the Horizon saw little new development. But then the new 128k static ram chips came out. The horizon board was redesigned to use these new chips, I believe this new board has been dubbed the SERIES 3000. The new SERIES 3000 board also incorporates in its design 3 or 4 fixes to improve reliability. About this time Gary Bowser of U.P.A. got involved. First he created the RAMBO daughter board for the Horizon (all versions), then he took every ones wish list for the Horizon ROS and created a new ros that not only supported the RAMBO upgrade but satisfied every ones wants!!!

Gary solved MANY compatibility problems that only surfaced when you add newer cards or multiple new cards from various manufacturers. Gary also re-wrote major portions of the code to either: 1. Speed operation, 2. Improve reliability or 3. Enhance and extend performance.

The SERIES 8 version of ROS is not a public domain program, but is licensed to Bud Mills Services for 10 dollars a copy. The other major enhancement Gary has made for the Horizon is a creation of his own called RAMBO. RAMBO stands for Random Access Memory Banking Option.

RAMBO gives the assembly program a way to use all or part of a Horizons memory as an extension of CPU memory allowing programmers to write longer programs or store data with out the over head normally associated with file creation/deletion/manipulation. All in all this board and software combination GREATLY enhances the versatility, easy of use and utility of any TI system. Also even if you have an older Horizon without RAMBO and never intend to use these new features I would highly recommend that you upgrade to this version because of its faster operation and piece of mind that you will get knowing all bugs that have surfaced have been fixed.

I will now give a list of features of the SERIES 8 ROS by OPA

1. Multiple Horizons of various sizes (if the RAMBO option is installed in any or all Horizons you can set aside partitions to be used as RAMBO memory. If you have a BIG Horizon (over 400k) you can and must partition this one physical drive into two logical drives.
2. The ability to reliably use 9938 equipped systems.
3. The scratch record option has for the first time been implemented in a DSR. The scratch record option was defined by TI as op code 8, but until now has been impossible to implement on any hardware.
4. You now have the capability to load and run assembly programs with out any module installed. EX. in basic DELETE "LD.6.UTIL1"
5. Programs you write or have been written to take advantage of ... can now directly load programs or data directly from the Horizon to CPU memory, bypassing VDP buffers giving you a noticeable increase in speed. The new version of Funnelweb will do this! The Myarc was the first DSR that made this facility easily available to the program, programs that are designed to quick load with the Myarc card should be compatible. The Corcomp controller also had the ability to do this, but it was as easily useable. An example of a program that directly loads is the Corcomp disk manager. ever noticed how fast it loads. The Corcomp disk manager and Myarc's DSR both provide the user with the ability to load and run assembler programs without a cartridge installed.
6. If you have a P-Gram card you can use assembly language to directly load cartridges into the P-Gram from the Horizon.
7. The ability to load a lower case character set of your choice has been retained. Having a true lower case character set can really enhance a program.
8. John Johnsons menu has now been updated to include extended path support. A big advantage to those who have harddrives.
9. The ability (for assembly language programmers) to write their own DSR (Device Service Routine) that will co-exist with the Horizon ROS. This gives the programmer a way to create custom calls accessable from any place in the

operating system with out the need to re-load everytime the computer is reset. Also by implementing your custom calls or device drivers in a DSR you do not eat up valuable CPU memory!!! If you have any questions feel free to contact:

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432 Jarvis Street Suite 502
Toronto, Ontario
Canada M4Y-2H3

Bud Mills Services
166 Dartmouth Drive
Toledo, OH 43614

416-960-0925 8am-11pm EST
Ask for Gary

419-385-5946 8am-8pm EST
Ask for Bud

This month at the meeting will be a Demo of a neat program called C-Shell99. C-Shell is a graphics environment much like the MAC, Windows for the IBM or GEOS for the Commodore machines. This demo will be shown and be available for copying. The author has provided us deal on a group purchase. Minimum requirements to run C-Shell99 are memory expansion 1 disk drive. Pretty lean by todays standards, of course any additional hardware you have can only enhance the programs performance.

We now have a taped demo of all the un-released TI programs for those of you who do not have a Gram device. Although you can not use the programs, you can at least see what was in the works. Major players who had programs in the works for the TI where Walt Disney, Siera-On-Line, Info-Com and it was even rumored that Borland was working on a port of their Turbo Pascal.

A Bit of Trivia. Info-Com had several games finished that they didn't consider worth marketing. Asgard software has bought the rights to these unreleased games and has made them available. Some of the games Info-Com developed where so large that they required not only memory expansion but also a super cart. Now how did the boys at Info-Com know about Super Carts?

I am writing a program that I had to create some custom input commands for. For these special input commands I wanted to use the BEEP and HONK sounds. The easy thing to do would have been to call and use a `onl` link to these routines (which reside in the console), but my goal is to make this program run able entirely from extended basic without memory expansion. I asked around if anyone had the equivalent of BEEP and HONK in a `Call Sound` statement. No one had. So I was forced to figure them out the hard way. Step 1. I pulled out my copy of the TI Intern manual (A disassembly of the TI operating system), I located the sound list that generated those tones. Step 2. I had to learn more than I ever wanted to know about the 9919 (The sound chip) and assembly language sound processing! Anyway, here are the fruits of my labor -

`Call Sound(160,218,0) ----` Produces the HONK sound

`Call Sound(160,1398,4) ---` Produces the BEEP sound

I hope to see you at the meeting. No one is as smart as all of us are together.

Bits and Bytes
By: Dan Eicher

Many of you have probably heard that the 9900 MicroProcessor is capable of directly addressing up to 64K, but what does that really mean?

In any Microprocessing unit you have three buses, the address, data and control bus. The amount of memory that a MicroProcessor is capable of addressing is a factor of width of both the address and data bus.

It is important to remember that these two busses can be any width. For example .. lets take a very simple processor with an address bus length of two and a data bus length of 4.

Here is the math for calculating the amount of addressable memory.

Data bus = 4 bits wide Address bus = 2 bits wide

04 Maximum number of unique address (2 2).
X 04 Number of bits held at each address.
16/8=2 bytes of addressable memory.

The 16 represents number of bits addressable, you need to divide this number by 8 to get bytes addressable (8 bits .EQU. byte).

Here is a picture.

| | | | |
|------------|--------|---------|-------------|
| Address 00 | = Data | 1 1 1 1 | 4 bits here |
| Address 01 | = Data | 1 1 1 1 | 4 bits here |
| Address 10 | = Data | 1 1 1 1 | 4 bits here |
| Address 11 | = Date | 1 1 1 1 | 4 bits here |

4 unique address = 16 bits total.

Now - Lets discuss the good old 9900.

Data Bus = 16 bits wide Address bus = 15 bits wide

32,768 Maximum number of unique address (2 15).
16 Number of bits held at each address.
524,288/8=65,536 bytes of addressable memory.

One K in computer byte is equal to the number 2 10=1,024. When you here people say a machine has 64k, what they really mean is the computer has 64 KiloBytes, which intern means it has 65,536 byte of memory.

In TI terms a bit is described as follows:

16 bits. Position 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

You always start counting with zero.
Bit position 0 is considered the Most Significant Bit or (MSB), this also the sign bit if you are using signed (+ or -) arithmetic.
Bit position 15 is considered the LEast Significant Bit or (LSB).

OK, that gives the basics that we need to get into the harder material. You are probably thinking if we only have 32K worth of unique address, why do you see memory maps that go up to

>FFFF (The greater than symbol means the value that follows is in hex)? Well, that's a good question and one that confused me for quite some time. Internally the 9900 has a 16 bit address pointer, but externally it has a 15 bit address bus. All this means is it is possible to do byte related arithmetic. Here is graphics example.

In reality.

How the 9900 sees the world internally.

Address 00 16 bits of data
 Address 01 16 bits of data
 " " " " " "
 Address 32K " " " "

Address 00 8 bits of data
 Address 01 8 bits of data
 " " " " " "
 Address 64K " " " "

Here is what happens inside the 9900 when you request an address. First an example will be an even address:

Lets say you want to inspect the contents of address 8. First the CPU takes this address and divides it by two, then it sends the appropriate commands and gives you the stored in real memory location 4.

Lets say you want to inspect the contents of address 7 (an odd address). Internally the CPU would say O'no an odd address! I can't access odd address externally! I'll decrement this address by 1 then I'll divide by 2. $(7-1)=6/2$ resulting in real address 3 since this is 16 bits I need to read in the whole word. Now that I have the full word I know he/she wants an odd address so I will take the right half of this word (8 bits) and send it to the user.

| Address! | | Data |
|------------|------------|---|
| Internally | Externally | Same. |
| 0 1 | 0 | 16 bits (Broken into a right and left byte). |
| 2 3 | 1 | |
| 4 5 | 2 | < Here is our example address. |
| 6 7 | 3 | |
| 8 9 | 4 | |

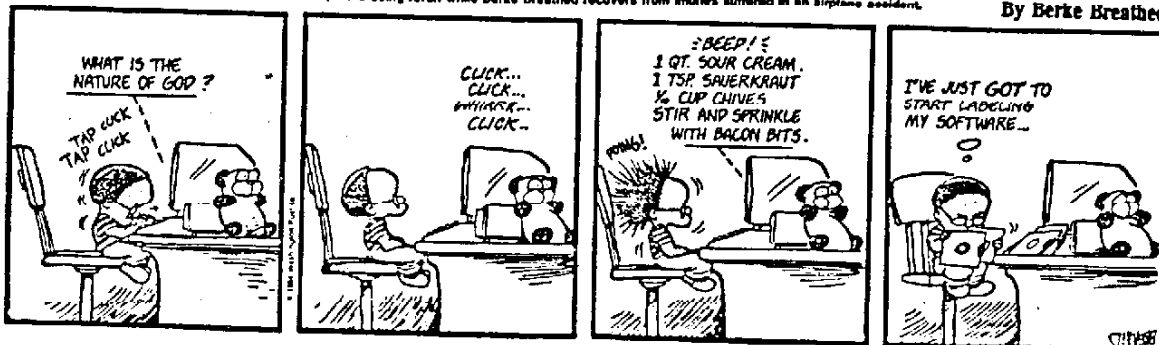
I admit all of this is a bit confusing. It is good to have a basic understanding of all of this.

Next installment we get in to some really hard stuff!

BLOOM COUNTY

These past strips are being rerun while Berke Breathed recovers from injuries suffered in an airplane accident.

By Berke Breathed



Hardware

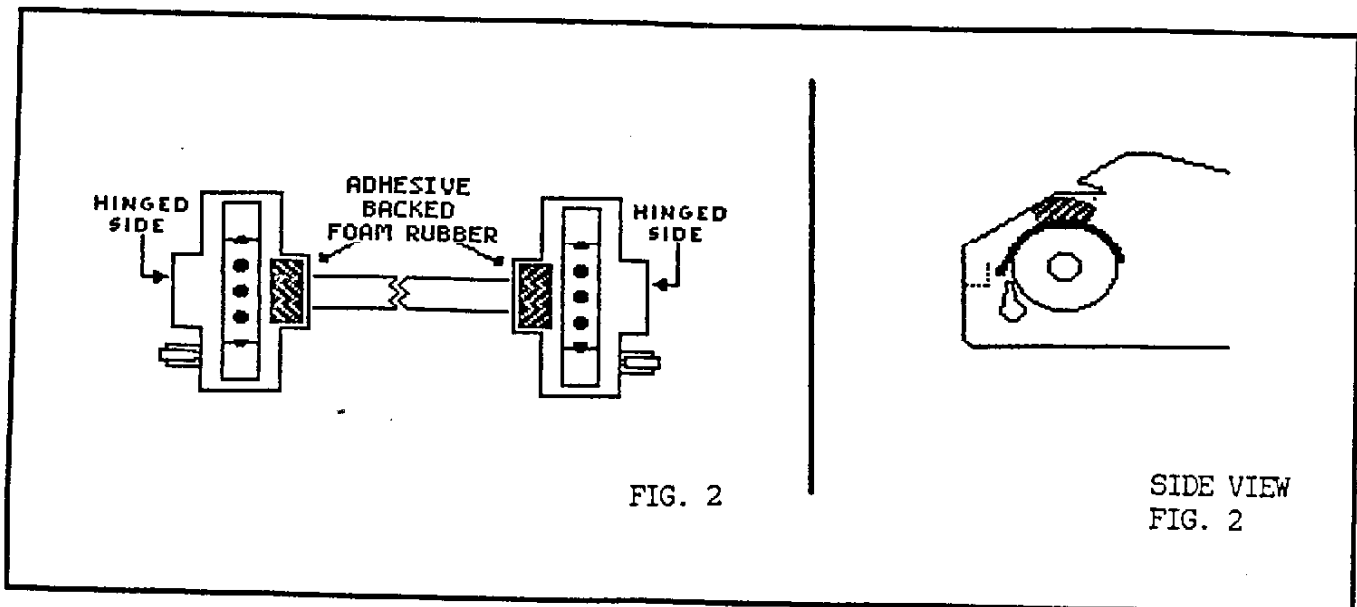
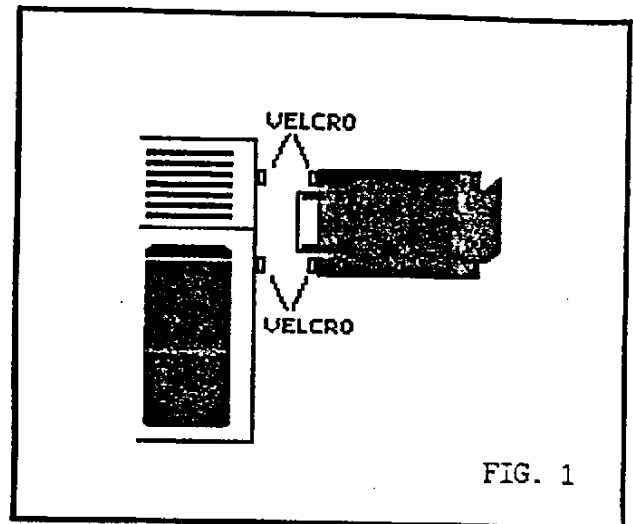
Q & D HARDWARE MODS

Steve Burns
Bluegrass 99'ers

Sometimes a simple straightforward solution is the best. Here are two examples of quite different problems that I solved in similar ways. Both took only seconds and have worked quite well.

The first problem was one that is common to nearly everyone who owns a TI and expansion box. The heavy connector and "firehose" cable that plugs in to the side of the console frequently comes loose when the console is moved. This fix requires only a small piece of adhesive backed Velcro. Cut two small strips to fit on either side of the connector and place them as shown in Fig.1. The Velcro will help prevent the "firehose" from pulling loose, even when the console is scooted all over the desk. This is cheap, easy and makes no permanent modification to either console or cable.

Another problem I had was using pinfeed labels with my NX-1000 printer. Although the printer should have handled them with no trouble, they kept jumping off the pins and jamming. The NX-1000 depends on little plastic covers to hold the labels on the pins. I took some adhesive backed sponge rubber (such as is used for weatherstripping) and placed it on top of the rear plastic pin covers so that when the rear printer cover is snapped in place, it prevents the little pinfeed covers from flipping up (see Fig.2). The labels now feed through flawlessly.



TI Print Shop

I have been fooling around with TIPS for christmas gifts for my grand childrens making pictures on "T" shirts. It make a great hit with them. They have over 4000 pictures to choose from. I put several pictures on a Tshirt. Just get your self a heat transfer ribbon for your printer they come in several colors.

The following is the procedure I used.

- 1 Put TIPS1#6/ER in drive #1.
- 2 Put IMAGE disk in drive #2. That a disk that has files such as GRGHTXT and GRGHXXX on it.
- 3 Use Extended Basic Module. It will automatic load TIPS.
- 4 Select #1 TIPS. About 30 sec to load.
- 4 Press any key unless you want to read the DOCS.
- 5 Enter 0 to 9 fonts. I used 1.
- 6 Input FONTTIPS Drive #. I used 1 again.
- 7 Characters in font 1 is shown. After charge song press any key.
- 8 Enter Drive # for Images. I used drive 2. press 2.
- 9 Enter 2 Char Image Prefix. I used GR. There are over 44 Inages Files. See #2.
- 10 After Files are displayed choose I (for Image)
- 11 Image name. I used GOLFERS. If you don't know the name choose L (list).
- 12 Choose V (view) to see picture on screen.
- 13 Choose S (sign).
- 14 Choose H (heat). This will print your picture reversed.
- 15 Make sure your printer is on and you has installed the HEAT TRANSFER ribbon.
- 16 Choose I (image). And away we go.
- 17 To put a name under the picture choose H (header). This will print Large letters 15 Max.
- 18 Type in your name. It will automatic center.
- 19 To print small letters press M (message). Up to 28 characters can be used. Also automatic center.
- 20 Now you need to IRON your paper picture on will a hot iron on the "T" Shirt.
- 21 You can make several pictures using the above procedure. And Iron on Front and Back Etc.
- 22 If you want to print the picture regular not reversed go to item 14 and choose P (poster).
- 23 Use regular ribbon if you donot want HEAT transfer.

GOOD LUCK HOPE YOU HAVE GOTTEN THIS FAR



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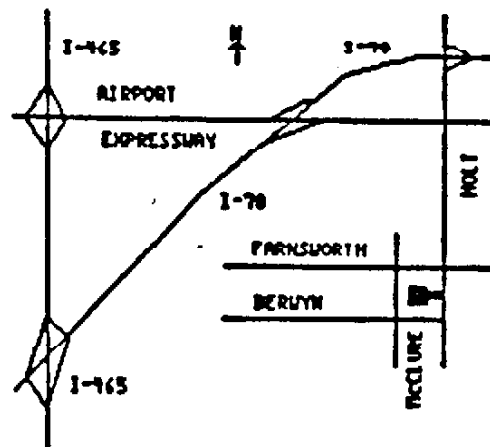
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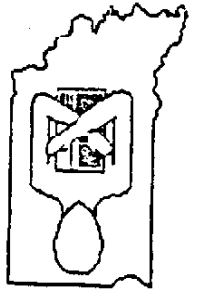
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